

628.1

C38

1868

Mystic Water Board.

1868.

EDWARD LAWRENCE,

JAMES DANA,

EVERETT TORREY,

ABEL E. BRIDGE,

} From the Citi-
zens at Large.

From the Board of Aldermen.

THOMAS R. B. EDMANDS,

From the Common Council.

THE
FOURTH ANNUAL REPORT
OF THE
MYSTIC WATER BOARD
OF THE
CITY OF CHARLESTOWN, MASS.
TO THE
CITY COUNCIL,

For the Year ending December 31st, 1868.



CHARLESTOWN:
PRINTED IN THE CHRONICLE JOB OFFICE.
1869.

THE LIBRARY OF THE
FEB 22 1946
UNIVERSITY OF ILLINOIS

REPORT OF THE STATE WATER BOARD

FOR THE YEAR 1900

ALBANY, N. Y., 1901

PRINTED BY THE STATE PRINTING OFFICE

ALBANY, N. Y., 1901

THE STATE WATER BOARD

ALBANY, N. Y., 1901

THE STATE WATER BOARD

ALBANY, N. Y., 1901

THE STATE WATER BOARD

ALBANY, N. Y., 1901

THE STATE WATER BOARD

ALBANY, N. Y., 1901

THE STATE WATER BOARD

ALBANY, N. Y., 1901

THE STATE WATER BOARD

ALBANY, N. Y., 1901

THE STATE WATER BOARD

ALBANY, N. Y., 1901

628.1
C38
1868

REPORT OF THE MYSTIC WATER BOARD.

OFFICE OF THE MYSTIC WATER BOARD,
CHARLESTOWN, March 15, 1869.

TO THE CITY COUNCIL:

THE Mystic Water Board has the honor to present herewith, the fourth Annual Report of the operations of the Water Works in its charge, together with the Annual Reports of the Clerk and Superintendent.

Our anticipations in relation to the financial success of the Works, have been fully realized, the receipts for Water Rates for the year 1868, being in excess of the interest on the Water Loan, and the cost of the maintenance of the Works.

Every department of the Works is believed to be in excellent condition. There has been no diminution of the ample supply of water at the Lake, and during the year no extraordinary repairs have been required, except at the Reservoir where the ice had caused some damage, and on a small portion of the Conduit. In the portion of Main street, where no suitable foundation exists, about 150 feet of the 16 inch iron and cement pipe has been taken up, and cast iron of the same dimension substituted at the expense of the contractors. All the other pipes continue to give satisfaction, and the number of leaks has been less than the average in iron pipes.

In conformity with the agreement approved by the City Council,

a contract has been executed with the town of Somerville for a supply of water, and during the past season, 13,223 feet of distribution pipe was laid in that town. A considerable revenue will doubtless be derived from this source, and, with the rapidly-increasing growth of the place, will be constantly augmenting. The acknowledgements of the Board are due to the Somerville Water Committee, for the courtesy and fairness exhibited in the negotiations for this important transaction. To carry out the provisions of this contract it was necessary to lay 1525 feet 12-inch pipe in Medford street, Medford, at a cost of \$3,776.70. This will be subject to any future arrangement that may be made with that town for a supply of water. Within a few years we shall doubtless receive an income from consumers on this line more than sufficient to defray the interest on its cost.

The pipes and structures necessary for conveying the water across Malden bridge to the Almshouse, have been completed, and hydrants have been located for the protection of property from fire. In addition to the Almshouse and buildings on the line of this pipe, a supply is furnished to the Chemical Works in Malden. The receipts, however, will not at present cover the interest on the cost. A 4-inch iron pipe has been laid on the wharf of the Mystic Improvement Co., at Chelsea bridge, and hydrants located for the protection of property there; this line of pipes was laid for the purpose of supplying tug-boats and the shipping in the harbor, and is found to be quite convenient and remunerative. It will be found necessary to lay a distribution pipe in Park street, from Henley to Common, as soon as the season will permit, and perhaps at an early day to complete the laying of pipes in several streets at the Neck. It is desirable also for the better preservation of the coal, that a shed for storage should be constructed at the Engine House.

Under the order of the City Council, six drinking-fountains for man and beast have been located in various parts of the City, and their constant use has fully demonstrated the great benefit and

utility of the project, the cost of these, including the setting, was \$1,415.05. The jets of the fountain in Winthrop square are not as satisfactory as desirable, and it is suggested to the City Council whether the erection of an ornamental fountain in Winthrop square, similar to that in City square, will not be advisable.

The question of supplying the towns of Medford and Malden, with Mystic Lake Water, has engaged the attention of the inhabitants of these places, and the Board has felt justified in giving them assurance that the city of Charlestown will be willing to furnish a supply upon like terms with those of Chelsea and Somerville. In this connection it is deemed by the Board to be very desirable to construct a new supply-main from the Reservoir, through Medford and Malden, to connect with the Chelsea pipes. This would not only be advantageous, as a means of safety by securing two lines of pipe, but would make our facilities ample for the delivery of a daily quantity sufficient to meet the demands for many years. In view also that a supply may be furnished to East Boston, the feasibility of which is under consideration, it is deemed that the additional cost of increasing the size of the pipes for this purpose may be justly shared by other parties.

The Annual Reports of the Superintendent and Clerk, herewith appended, furnish the details of operations during the year. Mr. H. G. Beatley, for several years the efficient Superintendent of the works, resigned on the 1st of January to take a similar position in Portland, Maine, and Mr. Charles H. Bigelow, of this city, was appointed to succeed him.

COST OF MAINTENANCE OF THE WORKS—1868.

Salaries,	\$3,750 00
Printing, Advertising, and Stationery,	424 95
Rents and Heating,	674 75
Contingent Expenses for Labor, Tools, &c.,	6,808 98
Clerk Hire,	730 25
	<hr/> \$12,388 93

PUMPING-SERVICE.

Fuel,	8,651 00	
Oil, Tallow, Tools, &c.,	1,221 75	
Pay of Engineers, Firemen, and Laborers,	2,663 81	
	<hr/>	12,536 56
		<hr/>
		\$24,925 49

Expenditures and Receipts on account of the Water Works to January 1st, 1869:

EXPENDITURES.

Construction Account,	1,038,921 06	
Interest Account,	212,706 74	
Maintenance Account,	78,006 28	
	<hr/>	\$1,329,634 08

RECEIPTS.

Water Rates,	219,504 04	
Accrued Interest and Premium on Bonds,	19,894 14	
Sundry Credits for Materials,	5,955 16	
Taxes Assessed for Interest,	38,000 00	
	<hr/>	\$283,353 34
Net Indebtedness on Account of the Works,		<hr/>
		\$1,046,280 74

Of the amount of indebtedness, the City of Chelsea pays the interest at the rate of six per cent. per annum on \$37,337.22.

The Board take great pleasure in again acknowledging the continued faithful and valued services rendered by Wm. W. Peirce, Esq., the Clerk of the Board.

Respectfully submitted.

EDWARD LAWRENCE,
JAMES DANA,
EVERETT TORREY,
ABEL E. BRIDGE,
THOS. R. B. EDMANDS.

REPORT OF THE CLERK
OF THE
MYSTIC WATER BOARD,
FOR THE YEAR 1868.

REPORT OF THE CLERK.

OFFICE OF THE MYSTIC WATER BOARD, }
 CHARLESTOWN, March 5th, 1869. }

EDWARD LAWRENCE, ESQ.,

PRESIDENT, MYSTIC WATER BOARD :—

SIR:—I have the honor to submit herewith, the Annual Report of the Clerk, for the year 1868, in conformity with the City Ordinance.

The number of water-takers registered December 31st, 1868, in Charlestown and Somerville was 3,616, in Chelsea 1,487, total number 5,103. The water during the year ending at that date, was supplied as follows, viz. :—

	Dwelling Houses	Families.	Stores and Shops.	Manu- factories.	Stables.
Charlestown and Somerville,	3,329	5,134	229	42	203
Chelsea,	1,364	1,727	82	5	46
Total,	4,693	6,861	311	47	249

The water has also been supplied for 10 tug-boats, 11 fire engine and hose houses, 51 public schools, 18 saloons, 40 offices, 13 churches, 4 armories, 4 hotels, 3 railroads, 1 brewery, 2 tanneries, 2 gas houses, 1 sugar refinery, 1 distillery, 1 pottery, 1 drain-pipe factory, 1 glass factory, 1 coal-oil company, the Navy Yard and Naval Magazine, State Prison, McLean Asylum, 2 city halls, and the Chelsea Ferry Co.

The amount of receipts for water rates has been as follows, for 1867, \$9,131.81; making the total receipts for that year \$60,188.83.

The amount received for 1868, from Charlestown and Somerville, was \$61,710.18, and there was due on the 1st of January, 1869, \$7,081.48, making the total \$68,791.66. The net amount received from Chelsea is \$16,121.29, making the total amount of water rates for 1868, \$84,912.95. The aggregate amount of water rates to January 1st, 1869, is \$219,504.04.

The expenses of the office for 1868 have been \$1,155.20, viz.: for Clerk hire, \$730.25; for printing, stationery, and advertising \$424.95. This includes all the charges for these items in every department connected with the works.

Statement showing the number and kind of Water-Fixtures contained within the premises of Water-Takers to January 1, 1869.

	Bath Tubs.	Water Closets.	Urinals.	Fountains.	Sinks.	Wash-Hand Basins.	Taps.	Private Hydrants.
Charlestown and Somerville,	429	756	40	4	4,723	795	1,032	111
Chelsea,	93	116		4	1,764	45	39	7
Total,	522	872	40	8	6,487	840	1,071	118

The number of places shut off for non-payment of the water rates was 37, 32 of which have been let on again. The amount collected for off and on water and fines was \$215.00.

*Statement showing the number and sizes of Water-Meters in use,
January 1, 1869.*

WHERE APPLIED.	SIZE OF METERS.					Total.
	$\frac{3}{8}$ -inch.	1-inch.	2-inch.	3-inch.	4-inch.	
U. S. Navy Yard, - - -					2	
State Prison, - - -					1	
Union Sugar Refinery, - -		4	1			
Marine Barracks, - - -				1		
Boston and Maine Railroad, -			1			
Eastern Railroad, - - -			2			
Eastern Cattle Station, - -			1			
Fitchburg Railroad, - - -			2			
Middlesex Horse Railroad, -	2					
Mystic Lake Brewery, - - -		1				
C. Guild & Son, - - -		1				
Charlestown Gas Company, -	1	1				
Ezra Trull & Co., - - -		1				
Thomas Cunningham, - - -		1				
Cook, Rymes & Co., - - -		1				
Tudor Co., - - -			1			
F. M. Holmes & Co., - - -			1			
Ashbel Waitt, - - -	1					
Amos Brown, - - -	1					
George S. Hall, - - -	1					
M. B. Sewall, - - -	1					
F. C. Sewall, - - -	1					
Stickney & Poor, - - -	1					
A. Waterman, - - -	1					
Mass. Glass Co., - - -	1					
Oriental Oil Co., - - -		1				
John P. Barnard, - - -	1					
John B. Dearborn, - - -	1					
Wm. S. & Geo. O. Wiley, - -	1					
Union Stable Company, - -	1					
Boston Ice Company, - - -	1					
Merriam & Norton, - - -	1					
O. Callahan, - - -	1					
Wm. Underwood & Company, -	1					
Waverley House, - - -		2	1			
Moore & Rideout, - - -	1					
H. D. Lockwood, - - -		1				
Hayward, Tilton & Company, -	1					
C. C. Perkins, - - -	1					
Maynard Brothers, - - -	1					
Amos Haynes, Somerville, -	2					
B. W. Patten, Somerville, -	1					
Skilton, Foote & Co., Somerville,	1					
Mass. Brick Co., Somerville, -		1				
Lowell Cattle Station, Somerville,		1				
Mystic Riding Park, Medford, -			1			
Chemical Works, Malden, -			1			
Magee Furnace Co., Chelsea, -		1				
Boston Elastic Fabric Co., Chelsea,			1			
White & Co., Chelsea, - -	1					
Porter, Cross & Messer, Chelsea,		1				
Farwell & Co., Chelsea, - -	1					
	29	18	13	1	3	64

Respectfully submitted.

WM. W. PEIRCE, *Clerk.*

REPORT OF THE SUPERINTENDENT
OF THE
CHARLESTOWN WATER WORKS,
FOR THE YEAR 1868.

REPORT OF THE SUPERINTENDENT.

CHARLESTOWN, January 10th, 1869.

EDWARD LAWRENCE, ESQ.,

PRESIDENT OF THE MYSTIC WATER BOARD:—

SIR:—I herewith respectfully submit the report of the Superintendent for the year ending December 31st, 1868.

LAKE.

The lake has furnished a daily average of 28,159,600 gallons. The average depth on overfall was 3.9 inches, equal to 25,700,000 gallons per day. The average daily water on overfall at waste-weir was 3,989,600 gallons. At the gate house a full new set of screen frames and flooring have been put in, the old ones having entirely decayed. The lumber used in new frames and flooring was Kyanized. Considerable trouble is experienced from the accumulation of leaves and twigs on the grating on the outside of the gate house. I would recommend that this grating be removed and placed inside the gate house; the gate could then be closed on either section, the water drawn from the chamber and the grating thoroughly cleaned at all times.

CONDUIT.

An examination of the conduit was made in April, and at the curve about one thousand feet below the waste-weir it was found pressed in towards the river some ten inches, and flattened at bottom and top for a distance of about one hundred and fifty feet. No serious result need be apprehended from this as there has been no

apparent change since it was first discovered. In October, repairs were made by thoroughly pointing up with cement and filling in with brick and cement where the openings were large enough to admit. The balance of the line is in excellent condition. That portion between head gate house and waste-weir, has considerable accumulation of vegetable matter which will need to be taken off in the spring. This, however, does not effect the water, the deposit being nearly all above the water line. No repairs have been made at lower gate house, and it is in good condition. It would be desirable at this point to remove the wooden mud-gate and put in its place a single-faced composition gate, as the tide water at times of repairing the conduit is very troublesome. The two thirty-six-inch pipes under the bed of the river are in good condition.

ENGINE HOUSE.

The engines and pumps are in perfect order, and continue to give entire satisfaction. They have been worked three hundred (312) days, on an average of 10.1 hours per day. They have pumped 658,061,955 gallons of water, being an increase of 21 per cent. in the number of hours, and 30.5 per cent. in the amount of water pumped, making 8,520,546 strokes, using 1,310,600 lbs. of coal for pumping, and showing an effective duty of 676,291 lbs. raised one foot high per lb. of coal. The amount of coal used for banking fires was 471,400 lbs. or 27.1 per cent. of the whole amount of coal used, and showing a loss by ash and clinker of 11.5 per cent. The pumps have required scarce any repairs, but like all machinery require constant attention. The duty of the pump could be perceptibly increased by properly protecting the coal used as fuel. A suitable shed should be built to protect the coal from the elements, as it is well known that a large loss always occurs when fuel is long exposed to the action of the weather. The grounds around the Engine House have been improved by grading, &c. Everything in and about the Engine House is in good condition.

RESERVOIR.

The Reservoir and grounds are in good condition. On February 22 a considerable leak was discovered in the embankment near the gate house; an examination showed it to be caused by the action of the frost on the outside chamber used as an overflow into the reservoir; the frost penetrating to the bottom, displaced bricks sufficiently to allow the water to pass through the 12-inch pipe to the foundation below. The pipe was stopped temporarily at this time, and the necessary repairs made in April.

At the same time it was discovered that in consequence of the great quantity of ice in the Reservoir, it being 22 inches in thickness and its estimated weight not less than 10,000 tons, the coping on two sides had been displaced.

The water in the northern division was then drawn off and cracks were found extending to within 12 feet of the bottom. It was not necessary to remove any of the stone coping as the cutting-out of the joints to a depth of six inches, and a careful pointing with cement, was all that was necessary to remedy the evil. It is gratifying to be enabled to state that although the water had not been drawn from the reservoir for about two years, there was no vegetable or impure matter contained in the bottom and but a very slight appearance of vegetable matter on the sides. The wooden drains at the reservoir have been replaced with stone-ware pipes.

The average depth of the water in the reservoir has been 19.7 feet equal to 22,928,085 gallons. At the gate house it will be necessary to put in a new drain from the bottom of the dry chamber. The drains laid were inadequate, owing to the rapid accumulation of carbonate of lime which has completely filled up the drain. I would strongly recommend laying a drain not less than twenty-four (24) inches internal diameter, as it is necessary from the nature of the deposit that access can be had at all times. A good use of the old twenty-four (24) inch cast iron pipe could be made for this purpose

as there would be no deposit from this. From a brick one at this depth the slow accumulation of tubercles would more than offset the deposit of lime.

SUPPLY-MAIN.

Only five leaks have occurred on this line, all but one of which were very slight, and none of sufficient size to require the main to be shut off. The line is now in good condition.

DISTRIBUTION.

All the distribution pipes are apparently in good condition and continue to give the same satisfaction as expressed in my report last year. The whole number of leaks occurring in Charlestown, Chelsea, and Somerville were forty-two (42) or less than one leak per mile of pipe. Trouble still existing on that portion of the sixteen inch at the Neck, one hundred and fifty-three (153) feet were removed and replaced by cast-iron pipe. This pipe has now been extended to hard ground, composed of loam and gravel, and that portion will now be little likely to give any farther trouble. Two of the solder joints only have ever shown any signs of leak, both of which were on the sixteen-inch pipe and were found defective in not being properly put on and the quantity of solder being much too small for the size of pipe. In Charlestown 985.5 feet of wrought-iron and cement and 4829 feet of cast-iron pipe have been laid down. This includes 495 feet of cast iron on Mystic Improvement Co.'s land to supply the shipping, and 3854 feet laid across Malden bridge to supply the Almshouse; of the latter 805 feet was of the pattern known as John F. Ward's spherical joint, and has given entire satisfaction. This pipe was carried down through the abutment wall, thence following the line of the bridge laying upon the "flats," each length, owing to the peculiar construction of the joint, conforming itself to the irregular bed of the river. This pipe is exposed for a considerable distance at every tide, and it became necessary to keep a circulation by wasting the water from the extreme end of the pipe during the

cold weather. This, on the night of December the 12th was neglected, and the pipe was frozen on the whole exposed line, a distance of 175 feet. It is impossible to ascertain how far into deep water the frost extends. The pipe is now being cleared, and it is hoped that the Almshouse and consumers on that side of the river will soon again receive the benefit they so briefly enjoyed.*

In Chelsea 13,197 feet of wrought iron and cement and 1,045 feet of cast-iron pipe have been laid down. All the cast-iron pipe being laid on marsh-land at a depth varying from 1.5 feet to 3 feet.

In Somerville 15,130.1 feet of wrought-iron and cement and 28.6 feet of cast-iron pipe have been laid.

In Medford 1,525 feet of wrought-iron and cement were laid.

In Malden 36 feet of cast-iron pipe were laid. On November 1st the Water was shut off at the reservoir at 8½ o'clock, A. M., for the purpose of making the connection with the Somerville distribution pipes by setting a twelve-inch stop-gate on supply-main on Medford street, Medford, at which time a ten-inch broken gate on Chelsea Bridge was taken out and branch plugged, an eight-inch stop-gate placed upon supply-main at Cambridge street, a ten-inch stop-gate on supply-main at Temple street, Somerville, and a sixteen-inch stop-gate set on wrought-iron and cement pipe on Main street near Baldwin street. The work was completed and water turned on at midnight the same day.

SERVICE PIPES.

During the past year 50,674.5 feet of service pipe has been laid, viz. :—

OF LEAD SERVICE,		
Charlestown,		12,878.5 feet
Chelsea,		34,422 "
Somerville,		1,735 "
GALVANIZED IRON,		
Charlestown,		310 "

* The pipes were cleared, and the water again let on January 13, 1869.

WROUGHT IRON AND CEMENT,

Charlestown,	788.5 feet.
Somerville,	540.5 "

1699 Corporation Service Cocks and 1600 Corporation Stop Cocks have been used.

The wrought-iron and cement service pipe in all cases have been used where water was required off the line of Main, and is very desirable, as the expense is much less than lead. Thus far the pipe has proved very satisfactory.

In Arthur Place one hundred and twenty (120) feet of semi-elastic pipe was taken up and replaced by galvanized iron.

HYDRANTS.

The "Lowry" Hydrants continue to give the same unqualified satisfaction that they have in previous years.

No new Hydrants of this pattern have been set the past year. Nine flush-side Hydrants of the Boston Machine Co.'s pattern have been set in places where it was either not practicable or the pipe too small to admit of a "Lowry."

In Somerville, nineteen post and two (2) flush side, and in Malden, three flush hydrants have been set.

The amount of repairs has been very small; only three new valves have been required for the "Lowry," and two for side hydrants.

DRINKING-FOUNTAINS.

Six Drinking-Fountains of the pattern known as the "Combination Drinking-Fountain," manufactured by D. D. Nast, of New York city, have been set, viz.:—

One, City Square, near Warren Street.

One, Main Street, near Reed's Corner.

One, Main Street, near Cambridge Street.

One, Henley Street, near Chelsea Street.

One, Bunker Hill Street, near Tufts Street.

One, Austin Street, near Front Street.

Too much cannot be said in praise of these fountains; they are alike an ornament and a blessing; and it seems to me the duty of every community, where there is a head of pure water that can be made available, to place one of these in every thoroughfare.

HYDRANT, GATE, AND STOP-COCK BOXES.

All the boxes used at the commencement of the work are beginning to show signs of decay. Several gate boxes have been removed, and hydrant boxes repaired.

The old straight stop-cock boxes have been replaced in a great measure by those of the new pattern, 472 of which have been put in. A small amount of Burnetized lumber was used early in the spring for stop boxes; the balance, for stop, gate, and hydrant boxes, has been Kyanized, which promises to be superior to any other known mode of preserving wood.

METRES.

Ten metres have been set the past year, viz.:—

Charlestown: one, 2 inch; one, 1 inch; three, 5-8 inch.

Chelsea: one, 2 inch; one, 1 inch; two, 5-8 inch.

Somerville: one, 1 inch.

All of these were of the Worthington pattern, none others at present being used.

HENRY G. BEATLEY,
Superintendent Charlestown Water Works.

ENGINE RECORD FOR 1868.

MONTHS OF YEAR.	Total pumping-time per month.	H. M.	Total number of strokes per month.	Number of lbs. of wood used per month.	COAL USED.			Per cent. of loss of coal by banking.	Per cent. of loss of coal by clinkers.	Average number of strokes per minute.
					Banking.	Pumping.	Total.			
			Strokes.	Pounds.	Pounds.	Pounds.	Pounds.	Per cent.	Per cent.	Strokes.
1868.										
January,	-	268.30	726,462	600	48,200	113,200	161,400	29.8	13.3	45.1
February,	-	259.30	718,172	700	45,600	109,200	154,800	29.4	13.3	46.1
March,	-	209.	574,409	800	38,200	77,900	116,100	30.5	12.5	45.8
April,	-	152.	406,722	700	30,200	56,000	86,200	37.5	14.3	44.6
May,	-	279.15	750,873	400	36,300	107,800	144,100	23.2	10.3	45.3
June,	-	291.30	767,544	400	37,000	122,000	159,000	23.2	11.	44.
July,	-	299.45	808,200	240	37,000	135,800	172,800	21.4	12.1	44.9
August,	-	270.30	729,188	400	37,100	117,500	154,600	23.8	10.1	44.9
September,	-	262.15	696,528	300	37,200	110,200	147,400	25.6	9.9	44.4
October,	-	273.15	736,460	300	42,200	114,200	156,400	27.	11.1	44.9
November,	-	278.45	768,044		40,200	111,600	151,800	27.	10.	45.2
December,	-	302.55	837,944		42,200	135,200	177,400	23.6	10.8	46.1

Extension of wrought-iron and cement pipe in Charlestown, 1868.

Prescott Street,	285.5 feet,	2 inch pipe.
Forrest Place,	158 "	2 "
Town Way,	276 "	2 "
Haverhill Street,	266 "	6 "

Extension in Somerville.

McLean Asylum,	441 feet,	4 inch pipe.
Flint Street,	14 "	6 "
Sycamore Street,	98 "	4 "
Broadway Place,	145 "	2 "
Perkins "	150 "	2 "
Marshall Street,	401 "	6 "
Pinckney "	233 "	6 "
Lincoln "	112 "	4 "
Medford "	2,174.9 "	12 "
Central "	3,669.7 "	12 "
Milk "	3,055.5 "	8 "
Washington "	2,830.9 "	8 "
Medford "	4.4 "	8 "
Summer "	783.6 "	6 "
Jenny Lind "	885.3 "	4 "
Spring and Howard Streets,	24.9 "	4 "
Laurel Street,	18.5 "	4 "
and	488.4 "	4 "

Which includes all the connections for setting nineteen post hydrants and connecting two reservoirs and one blow-off.

Extension of cast-iron pipe, Charlestown.

Main Street,	153 feet,	16 inch pipe.
Mystic Improvement Co.,	975 "	4 "
Malden Bridge,	3,854 "	8 "

**Somerville.*

Marshall Street,	22 feet,	4 inch pipe.
Central “	28.6 “	12 “

Malden.

Main Street,	36 feet,	8 inch pipe.
Chemical Works,	832 “	4 “

In Chelsea.

There has been laid down of wrought-iron and cement pipe —

296 feet of 8 inch.		
2,203 “ 6 “		
8,912 “ 4 “		
1,786 “ 3 “		

Of cast-iron pipe —

60 feet of 6 inch.		
985 “ 4 “		

Hydrants set in Charlestown, 1868.

One, Chelsea Street, near Chelsea Bridge,	Flush.
One, Sherman Square,	“
One, William Street,	“
One, Fitchburg Railroad,	“
Three on line of Malden Bridge,	“
Two, Mystic Improvement Company's wharf,	“

Hydrants set in Malden, 1868.

One, Malden line,	Flush.
Two, Chemical Works,	“

Hydrants set in Somerville, 1868.

McLean Asylum,	Flush.
Marshall Street,	“

Washington and Milk Streets,	Post.
Central and Summer	"
Summer and Harvard	"
Summer and Spring,	"
Washington, near Boston,	"
" " Medford,	"
" " Linden,	"
" opposite Tufts,	"
Milk, corner of Bow and Union Square,	"
Milk, between Bow,	"
" and School,	"
" " Laurel,	"
Central and Milk,	"
" " Highland,	"
" near Depot,	"
" " Belmont,	"
" " Medford,	"
Medford, near Lowell,	"
" " Broadway,	"

Hydrants set in Chelsea.

Washington Avenue.

Nichols and Franklin.

Summer and Spruce.

Whole number of Hydrants set in Charlestown, Somerville, Medford, Malden, and Chelsea.

Charlestown,	Lowry,	112
"	Common,	26
Medford and Somerville,	Lowry,	1
" " "	Post,	19
" " "	Common,	33

Malden,	Common,	3
Chelsea,	"	69

Cast-iron pipe laid in 1868.

	16-inch.	12-inch.	8-inch.	6-inch.	4-inch.
Charlestown,	153		3,854		975
Somerville,		28.6			22
Malden,			36		
Chelsea,				60	985

Wrought-iron and cement pipe laid in 1868.

	12-inch.	8-inch.	6-inch.	4-inch.	3-inch.	2-inch.
Charlestown,			266			719.5
Somerville,	5,844.6	5,890.8	1,431.6	2,368.1		295
Medford,	1,525					
Chelsea,		296	2,203	8,912	1,786	

Total number of feet of pipe and stop-gates laid in Charlestown, Somerville, Medford, Malden and Chelsea, Dec. 31, 1861.

	36-in.	30-in.	24-in.	16-in.	12-in.	10-in.	8-in.	6-in.	4-in.	3-in.	2-in.
C. iron,	974	3581.1	16761.3	5228.9	108.6	82	3952	700.5		69	
W. iron & cement,	40.5			5053	9369.6	8822	37801.8	59254.6	97561.1	21191.5	11333.5
Stop gates,	2	2	5	8	11	22	140	233	33	90	

Whole amount of cast-iron pipe, 33,239 feet=6 miles, 1,559 lineal feet.

Whole amount of wrought-iron and cement pipe, 250,592.1 feet, or 47 miles, 2,432 lineal feet.

Whole number of stop gates, 546.

Lead services, Corporation and stop-cocks laid in Charlestown, 1868.

	1½-inch.	1-inch.	¾-in.	½-inch.	⅜-inch.	Aggregate.
Length of pipe in feet,	5	1,705	8	2,703.5	9,087	13,608.5
No. of stops, Corporation,			6	1	89	307
" " service,	1	6	1	62	407	477

Lead services, Corporation and stop-cocks laid in Somerville and Malden, 1868.

	1-inch.	$\frac{3}{4}$ -inch.	$\frac{5}{8}$ -inch.	$\frac{1}{2}$ -inch.	Aggregate.
Length in feet,	31	20	578.5	1,162	1,791.5
No. of stops, Corporation,	2	2	20	40	64
“ “ services,	3	9	22	39	73

Lead services, Corporation and stop-cocks laid in Chelsea, 1868.

	1-inch.	$\frac{3}{4}$ -inch.	$\frac{5}{8}$ -inch.	$\frac{1}{2}$ -inch.	Aggregate.
Length in feet,	145	358	2,628.	31,291	34,422
No. of stops, Corporation,	5	10	74	1,041	1,130
“ “ services,	5	10	75	1,141	1,231

Summary of service pipes, Corporation and stop-cocks laid in Charlestown, Somerville, Medford and Chelsea, Dec. 31, 1868.

	$\frac{1}{2}$ -inch.	$\frac{3}{8}$ -inch.	$\frac{1}{4}$ -inch.	1-in.	1 $\frac{1}{2}$ -in.	2-in.	3-in.	
Lead pipe,	106984.5	27516	1192.5	2517	14.5	28	27	138279.5
Galvanized iron,						1392	47	1439
Semi-elastic,	240		51			468		759
W. iron & cement,			531.5	807.5				1348.5
Iron and glass,				64				64
No. of stops, Corp'n.	3789	805	63	33	1	1	3	4695
“ “ service,	4742	682	68	38	3	1		5534

TABLE OF OBSERVATIONS AT LAKE AND DISTRIBUTION OF WATER.

MONTHS OF YEAR.	Depth of water above bottom of Conduit.		Surface of Lake		Depth of water in Reservoir.		Depth of water on six-foot overfall.		Water in rain-guage in ounces.		Depth of rain-fall in inches.		Temperature of water in Gate House.			Temperature of air in the shade.			Number of gallons of water drawn from Reservoir per month.		Average number of gallons drawn from Reservoir per day.		Average number of gallons for each inhabitant per day.		Average number of gallons for each consumer per day.		
	Feet.		Feet.		Feet.		Feet.		Feet.		Feet.		6 A. M.			6 P. M.			6 A. M.		6 P. M.		6 A. M.		6 P. M.		
	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	6 A. M.	12 M.	6 P. M.	6 A. M.	12 M.	6 P. M.	6 A. M.	12 M.	6 P. M.	6 A. M.	12 M.	6 P. M.	6 A. M.	12 M.	6 P. M.
1868.																											
January,	-	4.6	9.7	21.2	1.44	2.14	33	30.3	23.9	18.3	2.14	33	30.3	23.9	18.3	30.3	23.9	56,046,358	1,807,947	43	69						
February,	-	4.6	9.6	20.7	1.01	1.68	33	27.5	23.5	15.8	1.68	33	27.5	23.5	15.8	27.5	23.5	55,145,963	1,901,550	45	70						
March,	-	4.6	10.1	19.5	4.02	1.365	34	42.1	33.9	31.8	1.365	34	42.1	33.9	31.8	42.1	33.9	47,244,584	1,524,019	36	56						
April,	-	4.6	10.4	21.7	5.9	4.215	40.7	48	42	41.7	4.215	40.7	48	42	41.7	48	42	46,195,608	1,573,476	37	58						
May,	-	4.6	10.5	9.7	7.3	9.97	54.2	60.1	54.5	52.3	9.97	54.2	60.1	54.5	52.3	60.1	54.5	46,567,369	1,602,185	40	59						
June,	-	4.6	10.3	20.1	4.8	2.41	63.9	72.7	67.5	66.1	2.41	63.9	72.7	67.5	66.1	72.7	67.5	53,895,537	1,736,515	42	66						
July,	-	4.6	10.1	20.9	1.1	1.04	80.3	85.2	78.7	72.5	1.04	80.3	85.2	78.7	72.5	85.2	78.7	62,237,632	2,012,561	47	74						
August,	-	4.6	10.1	21.3	.9	3.59	73.2	80.1	73.8	69.7	3.59	73.2	80.1	73.8	69.7	80.1	73.8	57,550,731	1,856,456	44	68						
September,	-	4.6	10.25	21.5	1.5	8.30	69.1	69.2	62.2	59	8.30	69.1	69.2	62.2	59	69.2	62.2	51,536,577	1,717,886	40	63						
October,	-	4.6	9.9	21.4	1.4	45	57.4	63.6	47.9	44.3	45	57.4	63.6	47.9	44.3	63.6	47.9	56,439,132	1,817,392	43	67						
November,	-	4.6	10.2	21.5	3.1	4.62	42.8	44.3	39.2	32.3	4.62	42.8	44.3	39.2	32.3	44.3	39.2	53,124,035	1,971,313	46	72						
December,	-	4.6	9.8	21.4	1.8	1.34	33.3	32.2	29.2	22	1.34	33.3	32.2	29.2	22	32.2	29.2	64,999,411	2,096,755	49	77						

NOTE. The Conduit is 5 feet 8 inches in height. High water mark in Lake is 11 feet 2 inches above bottom of Conduit.

Materials on hand in pipe yard.

Iron Pipes, 3 of 36 inch diameter.

“ “ 123,632 lbs. of cracked pipe.

Whole Sleeves, 2 of 36 inch diameter.

“ “ 5 “ 30 “ “

“ “ 6 “ 24 “ “

Clamp “ 3 “ 30 “ “

“ “ 2 “ 24 “ “

“ “ 7 “ 6 “ “

“ “ 2 “ 4 “ “

16 cubic feet of Stone, 8 Window Sills.

TOOLS AT HEAD GATE HOUSE.

2 Bars, 3 Chains, 4 Box Hooks, 1 Net, 50 lbs. Rope, 2 Hoes,
3 Grapples, 2 Ice Chisels, 1 Lantern, 1 Boat, 1 Boat Hook, 4 Oars,
1 Wheelbarrow.

TOOLS AT TOOL HOUSE.

1 Iron Bar, 15 Points, 1 Hand Hammer, 4 Chisels, 3 Sets,
1 Furnace, 5 Drills, 1 Calking Hammer, 1 Lead Pot, 2 Trowells,
2 Stone Hammers, 1 Gin Derrick, 3 Picks, 3 Pipe Scrapers, 1 pair
Pipe Calipers, 4 Shovels, 2 Blocks, 1 Center Cross, 1 24-inch Gate
Gear, 1 set Block and Fall.

TOOLS AT ENGINE HOUSE.

3 Iron Bars, 1 Sledge, 1 Portable Forge, 1 Truck, 1 Deferential
Block, 1 Ratchet, 1 Level, 1 Plane, 1 Square, 1 pair Bellows, 2 pair
Tongs, 18 Wrenches, 1 Hand Drill, 1 Drill Machine, 12 Files, 1
Chisel, 1 Set Tap, 1 Grindstone, 1 set of Tongs, 1 Anvil, 12 Open
Wrenches, 2 Fairbanks' Scales, 12 Cold Chisels, 2 Vises, 2 Saws,
1 Die Stock and Dies, 1 Desk, 2 Clocks, 1 Lantern, 150 feet Hose,
2 Hand Lamps.

STORES AT ENGINE HOUSE.

20 gal. Tallow Oil, $4\frac{1}{2}$ gal. Sperm Oil, 23 lbs. Rubber Cloth, 9 lbs. Hemp Packing, 268 lbs. Round Iron, 40 feet $\frac{1}{2}$ Pipe, 25 feet $\frac{3}{8}$ Pipe, 10 feet 2 Pipe, 65 lbs. Nails, 392 Bolts, 500 Fire Brick, 1 bbl. Kaolin.

There was remaining on hand 270 tons of coal and 4 cords of Pine Wood.

TOOLS AT RESERVOIR.

1 Wheelbarrow, 3 Water Pails, 1 Oil Can, 1 old Pump, 1 set Blocks and Falls, 1 Lantern, 1 new Pump, 1 Net, 1 Iron Roller, 1 Border Cutter, 3 Hoes, 1 Stove.

MATERIALS ON HAND AT ENGINE HOUSE AND RESERVOIR.

3 Copper Oil Cans, 2 Drains, 2 Oil Fillers, 1 Rain Gauge, 1 Stove, 1 Bedstead, 12 yards Oil Carpet, 2 Oil Cans, 1 Tin Lantern, 1 Stove, 3 Brooms, 1 Table, 6 Chairs, 2 Water Pails, 90 feet $\frac{3}{4}$ Rubber Hose, 2 Brass Drains.

MATERIALS AND TOOLS ON HAND AT CHELSEA-STREET SHOP.

78 lbs. Plumbers' Solder,	7 2-inch Quarter Bends,
10 lbs. Block Tin,	1 2-inch Ludlow Valves,
35 lbs. Block Tin Solder,	1 2-inch Peet Valves,
$5\frac{1}{2}$ lbs Bismuth,	2 2-inch Unions,
5 lbs. Cardmium,	3 4-inch Plugs,
57 $\frac{1}{2}$ -inch Stop cocks,	3 2-inch " "
37 " "	3 Flush Hydrants,
182 $\frac{3}{4}$ " "	2 Casings and Covers,
78 1 " "	1 12-inch Bell Gate,
5 $1\frac{1}{4}$ " "	1 10-inch Spigot Gate
1 2 " "	3 6-inch " "
200 $\frac{1}{2}$ -inch Corporation Cock,	2 4-inch " "
200 $\frac{3}{8}$ -inch " "	68 1-inch Solder Nipples,
84 $\frac{3}{4}$ -inch " "	89 $\frac{3}{4}$ -inch " "
70 1-inch " "	20 $\frac{1}{2}$ -inch " "
8 $1\frac{1}{4}$ -inch " "	2,100 feet $\frac{1}{2}$ -inch Lead Pipe,



3 0112 119915970

120 feet 1-inch Tin lined Pipe,	50 feet Rubber Hose, 3 Oil Cans,
300 " $\frac{3}{4}$ -inch Lead Pipe,	4 Cold Chisels, 2 Caulking Ham-
1,080 " $\frac{3}{4}$ -inch "	mers, 5 Iron Bars,
80 " $1\frac{1}{2}$ -inch "	2 16-inch Clamp Sleeves,
140 " 1-inch "	9 Meter Covers,
42 " 2-inch "	12 Flush Hydrant Covers
342 " 1-inch W.I. & C. Pipe,	5 " " Frames,
40 " $\frac{3}{4}$ -inch " "	6 Lowry Hydrant Covers,
1 1-inch Worthington Meter,	13 " " Frames.
2 $\frac{5}{8}$ -inch " "	45 " " Caps,
2 2-inch Aubin Meter,	4 Flush Hydrants,
2 1-inch " "	2 Grand "
1 $\frac{5}{8}$ -inch " "	1 16-inch Wro't Clamp Sleeve,
4 bbls. Cement,	1 Horse, 1 Wagon,
1 bbl. French Cement,	1 Handcart, 1 Wheelbarrow,
15 Picks, 19 Shovels,	1 pair Scales,
6 Rammers, 2 Cement Boxes,	1 Lamp, 1 Vise,
1 Handcart, 3 Bars,	1 Sieve, 1 Ratchet,
3 Hydrant Valves,	2 Screw Drivers,
1 Hydrant Stem,	5 pair Tongs, 3 Solder Irons,
8 Pumps, 4 Hammers, 1 Mallet,	2 Tape Lines, 5 Chisels,
3 Monkey Wrenches, 3 Gate	4 Taps, 1 Water Pot,
Wrenches,	1 Pressure Gauge, 1 lb. Powder,
1 Wharf Wrench, 2 Stop-Cock	2 pair Shears, 1 Saw,
Wrenches,	3 Axes, 2 pair Galitongs,
2 Lowry Hydrant Wrenches,	2 Oil Fillers, 1 Shave Hook,
2 Flush Wrenches,	1 Bit Stock, 2 Punches,
2 Lead Pots, 1 Bit Stock,	4 pieces 6-inch Cast-Iron Pipe,
1 set Caulking Irons,	2 " 8-inch " "
8 Pipe Drills,	4 " 3-inch " "
1 Lead Pot Furnace, 2 Ladles,	2 " 4-inch " "
1 Hatchet, 2 Rasps,	2 6 by 4-inch Cast-Iron Reducers,
2 Furnaces, 2 Plumber Irons,	1 4 by 2-inch " "
1 Grindstone, 2 Trowels,	1 4 by 3-inch T Branches,
2 Oil Cans, 1 pair Compasses,	1 4-inch " "
2 Hydrant Pumps, 1 Derrick,	1 8-inch Quarter Bend,
$\frac{1}{2}$ bbl. Varnish, 4 lbs. Rosin,	5 4-inch " "
2 Paving Hammers, 1 Square,	2 Harnesses, 2 Blankets.